

Dunstall Lane, St Mary's Bay, Romney Marsh



SuDS used

- *Swales*
- *Attenuation pond*

Benefits

- *Water quantity control*
- *Water quality control*
- *Amenity*
- *Biodiversity*

1. Location

Dunstall Lane, St Mary's Bay, Romney Marsh, Kent, TN29 0QW



2. Description

In 2011 approval was granted for 72 houses on an existing caravan park of approximately 3 ha on Dunstall Lane, St Mary's Bay. The site had been in a derelict condition with both its permanent buildings and caravans removed, development was intended to deliver a high quality development with a rural feel providing a mix of housing styles. Since approval in 2010, the first phase of 7 houses on Phase 1 area of 0.7 ha has been completed but the remainder of the site is yet to move forward.

3. Main SuDS components used

All surface water runoff will be diverted to linked swales and conveyed to a detention basin upstream of a vortex control prior to discharge to the Clobdsen Sewer (EA Main River).

4. How it works

The majority of surface water is dealt with at the surface rather than relying on a piped network (Figures 1, 2 and 3). All units and frontages are to be set higher than the carriageway to ensure the flow of surface water. This was required given the minimal level difference between the proposed development (ranges from 2.20mAOD to 2.80mAOD) and the outfall level into the Clobdsen Sewer and the Golden Sands Sewer. The Clobdsen Sewer has a summer retained water level of 1.2mAOD and therefore the Phase 1 outfall invert level was set above this (1.3mAOD).

Each unit in Phase 1 has a swale adjacent to the public highway to collect the surface water from each plot (Photo 2 and 4). These swales then connect via a pre-formed Swale inlet and outlet unit which run under the driveway to each plot before connecting to the detention basin.

The carriageway surface water system for Phase 1 relies upon the cross fall to direct runoff to the longitudinal swale (Photo 3) rather than the long fall driving the surface water to traditional piped gully system. As such due to the fixed outfall level and position the road alignment was designed to suit the surface water drainage requirements.

Due to the surcharged outfall conditions it is necessary to provide a detention basin which will provide a total of 180.5m³ of storage upstream of the vortex flow control manhole. The pond operates at a depth of 0.475m.

The swales and piped network has been designed to not surcharge in the 1:2 year return period and to surcharge but not flood in the 1:30 year return period and to retain the 1:100 year event plus a thirty percent increase to allow for climate change.

5. Specific project details

The development site was considered a “brownfield” site however the calculation of impermeable area was reduced given the areas were not contiguous and surface water would not likely reach a watercourse. The final total discharge rate within the drainage strategy has been agreed with the EA, Romney Marsh Area Internal Drainage Board (RMAIDB) and Shepway District Council for the 1:2 year, 1:30 year and 1:100 year rainfall events as 9 l/s/, 23 l/s/ and 33 l/s. These are then reduced to 2.34 l/s, 6.09l/s and 8.73l/s for the reduced catchment area within Phase 1.

The site layout has been constrained by adjacent watercourses, particularly the Clobden Sewer, an EA Main River which requires an 8m byelaw margin and the Golden Sands Sewer, an RMAIDB maintained water course on the southern boundary requires similar bylaw requirements. Separation from the RMAIDB watercourse was further negotiated to accommodate a suitable sized detention basin.

The SFRA Historical Flood Map confirms that the site and parts of the surrounding existing residential area were affected by fluvial flooding during the winter of 2000/01. Fluvial flood risk which set FFLs and the site’s slack levels required early consideration. Due to minimal level variation and eave level requirements slack long fall on the carriageway lead to the inclusion of a swale adjacent to the carriageway to convey the surface water to the detention basin. All individual house downpipes were picked up by a dished channel which had a long fall around the dwelling to convey the water to the localised swale (Photo 5).

6. Maintenance & operation

The drainage and highways for Phase 1 have been approved for adoption under Section 38 of the Highways Act and are currently under a five-year maintenance cycle. Commuted sums based upon KCC standard sums have been calculated.

7. Monitoring and evaluation

The drainage system is currently maintained by a contractor under maintenance and is expected to be assessed for hand-over to KCC in 2022. All aspects of highways and drainage construction were inspected against approved plans for KCC to sign-off the works by the KCC and Peter Brett Associates LLP (the engineer).

8. Benefits and achievements

The Dunstall Lane site is representative of many development locations across Kent which have little fall and shallow invert levels in receiving watercourses. The non-conventional drainage solution developed through consultation with the adopting authority met the constraints on ground levels, invert levels, provision of attenuation with positive drainage systems, maintenance access arrangements whilst also including source control and providing a scheme with added landscape value, visual benefit, amenity and biodiversity benefits.

9. Lessons learnt

- Early consultation with consenting authorities is paramount to defining the design solution. Much of the input to the discharge rates occurred through the planning process where a certain amount of design time had already been invested.
- A design solution could not be found without the flexibility provided by KCC Highways. Early consultation with KCC Highways enabled a design solution to be developed to the satisfaction of KCC as Highways and later adopting authority.

- The design criteria for the highway swales are tight and do not reflect standard side slopes and widths. This design arrangement should be assessed by the adopting authority over-time to inform design criteria.
- Inspection of the drainage works highlighted the need for care as swales on the housing side were prone to washout and leaving stagnant water.

10. Interaction with local authority

Discussions pre-LLFA statutory consultee were commenced with KCC as Highways Authority with the submission for discharge of conditions in 2012 and later supported the submission of the scheme for adoption.

11. Project details

Construction completed: *November 2016*

Cost: *Highway and drainage costs £94,500 with a SuDS commuted sum of £66,948*

Extent: *1340m² / Ha or 13.4%*

12. Project team

Funders	<ul style="list-style-type: none"> • Developer Agent – Martin L Backx CMB Management Services Ltd
Clients	<ul style="list-style-type: none"> • Pinnacle Universal Ltd.
Designers	<ul style="list-style-type: none"> • Surface Water and Highway Design - Peter Brett Associates • Planning – Guy Holloway • Landscape – Mark Hanton Studio
Contractors	<ul style="list-style-type: none"> • Thakeham
Other	<ul style="list-style-type: none"> • Adopting Authority – Kent County Council

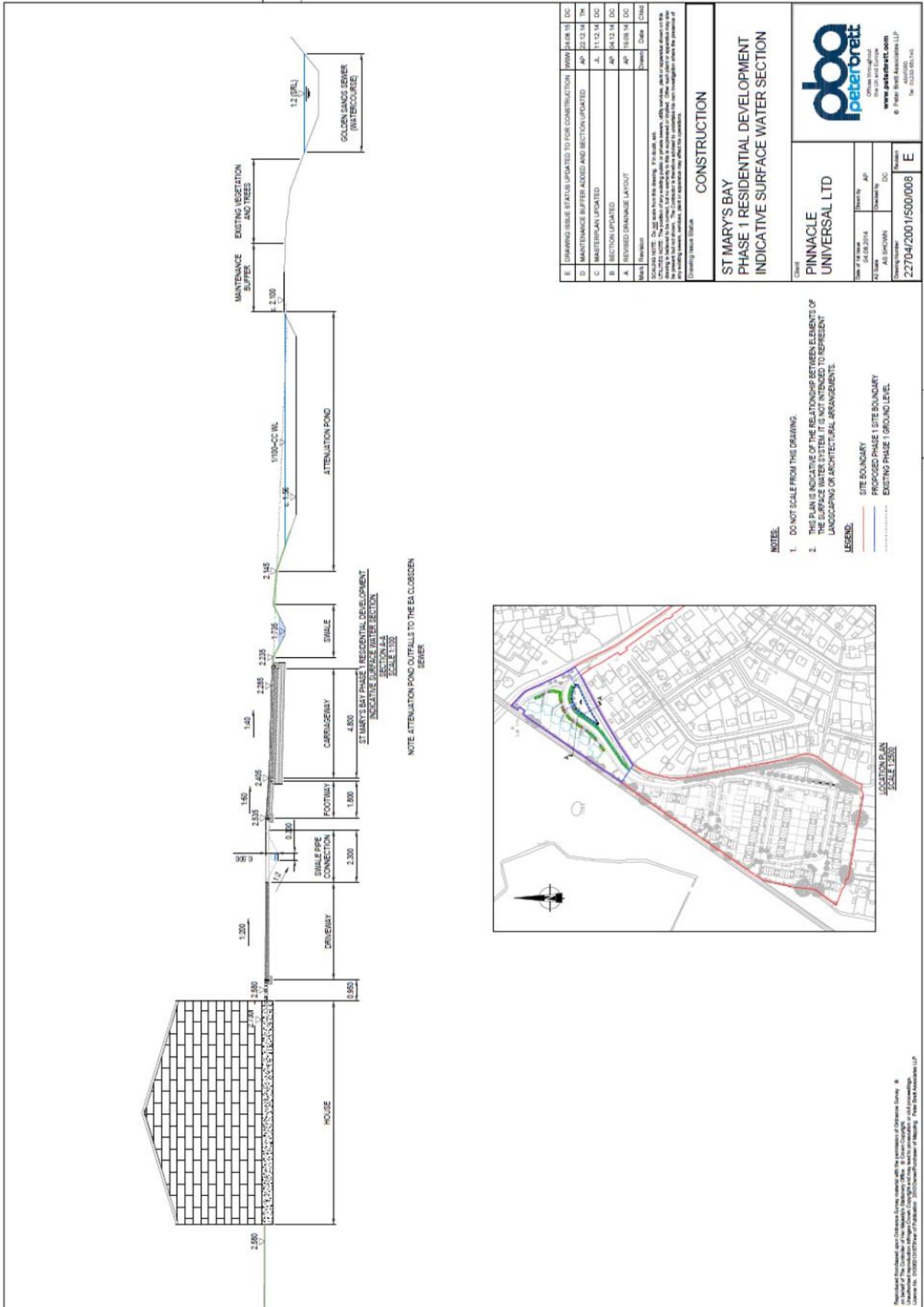


Fig 2: Cross-section



Fig 4



Fig 5



Fig 6



Fig 7



Fig 8